

RocData 4.0

Analysis of rock, soil and discontinuity strength data

rocscience software tools for rock and soil

RocData is an interactive toolkit for the analysis of rock and soil strength data. Strength envelopes and other parameters can be determined from curve-fitting of test data. RocData includes RocProp, a database of intact rock properties which runs as a standalone application.

Strength Criteria

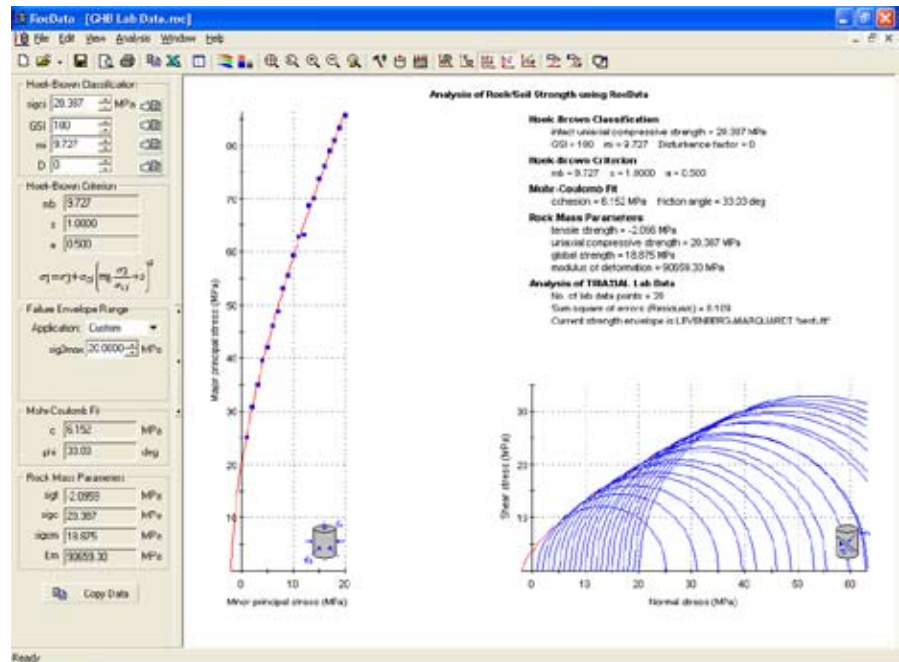
Strength criteria include linear Mohr-Coulomb and non-linear Generalized Hoek-Brown, Barton-Bandis and Power Curve. These can be applied in the analysis of intact rock, rock mass, soil or discontinuity (joint) strength data. *RocData* is highly interactive and allows you to easily test different strength parameters and observe how they impact a failure envelope. Input parameters can be estimated from built-in charts and tables. Equivalent Mohr-Coulomb parameters are calculated for non-linear envelopes.

Curve Fitting of Test Data

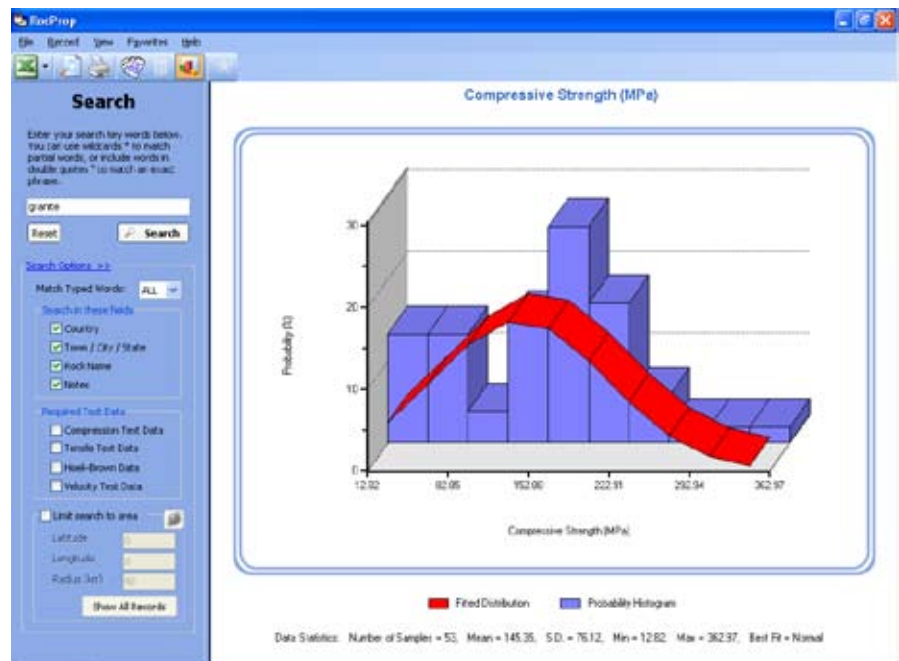
Strength test data from triaxial or direct shear tests can be entered to determine the “best fit” strength envelope and associated parameters (e.g. cohesion and friction angle) for a rock or soil. The data can be obtained from lab tests of intact samples, or field data from in-situ rock mass tests. Failure envelopes are plotted in both shear-normal and principal stress space. *RocData* results can be used as input for numerical analysis programs such as *Slide* or *Phase²*.

RocProp Database

RocData now includes *RocProp*, a database of intact rock properties which currently contains over 600 test records from worldwide sources. The data includes rock type, geographical location, compressive and tensile strength, elastic properties, Hoek-Brown parameters and velocity parameters. The database can be searched and filtered in various ways, and allows users to create charts, generate statistical information, and add their own data in a user database.



Best-fit strength envelope for triaxial test data, Generalized Hoek-Brown criterion. Data is displayed as points on the principal stress envelope and Mohr circles on the shear-normal envelope.



RocProp histogram chart of compressive strength data for granite. The best fit statistical distribution is also displayed.

Strength Criteria

- Mohr-Coulomb
- Generalized Hoek-Brown
- Barton-Bandis
- Power Curve

Stress Units

- Metric (MPa, kPa, tonnes/m²)
- Imperial (psi, psf, ksi, ksf, tons/ft²)

Analysis of Test Data

- triaxial or direct shear test data
- lab or field (rock mass) data
- curve fitting methods: Levenberg-Marquardt, Simplex, Linear Regression
- best fit residuals
- data entry – in spreadsheet, from clipboard, import file (.roc, .rlb, .txt, .csv)

Failure Envelope Plots

- principal stress plot (sigma1, sigma3)

- shear-normal plot (tau, sigmaN)
- interactive plot display
- stress sampler
- instantaneous Mohr-Coulomb sampler
- equivalent Mohr-Coulomb envelope for non-linear criteria
- display test data on plots

Estimating Input Parameters

- Estimation of input parameters from built-in charts and tables:
 - GSI, mi, sigci, D
 - c, phi
 - JRC, JCS, phir

Additional Output Parameters

- Hoek-Brown: rock mass tensile strength, compressive strength, deformation modulus
- Mohr-Coulomb: uniaxial compressive strength, alpha angle

- Power Curve: uniaxial compressive strength, tensile strength

Equivalent Mohr-Coulomb Parameters

- equivalent cohesion and friction angle for non-linear criteria
- user-defined stress range
- instantaneous (tangential) cohesion and friction angle

Exporting Results

- one click export to Excel
- copy to clipboard
- export image file (.jpg, .bmp, .emf, .wmf)
- export *Slide* shear-normal function

RocProp Database

- primary database of intact rock properties (600+ records)
- search and filter by rock type, data type, geographical coordinates etc.
- charting and statistics
- user database
- link to Google maps
- export to Excel

Price & Licensing

RocData 4.0 is sold as single licenses, which are purchased outright, for \$795 US (\$955 CDN).

Network licenses are also available; they are sold as a yearly subscription, with price based on the number of concurrent users. Please contact software@rocscience.com for more information.

www.rocscience.com

Calculate mi, GSI, mb, s and a from Rock Mass Data

Rock Mass Data
Curve-Fitting Method: Levenberg-Marquardt

Input Parameters:
sigci: 30 MPa D: 0

Number of Tests: 20

#	sig3 (MPa)	sig1 (MPa)
1	1	7.11948
2	2	10.9364
3	3	13.826
4	4	15.2284
5	5	18.4258
6	6	20.9116
7	7	23.4371
8	8	26.5577
9	9	27.9813
10	10	29.1231
11	11	32.0842
12	12	32.977
13	13	35.5527
14	14	37.8724

mi: 13.555 GSI: 34.757
mb: 1.319 s: 0.001
a: 0.516

Plot Mogi's Line Residuals: 5.189

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